Fact Sheet
AIR FORCE SPACE COMMAND

DIRECTORATE OF PUBLIC AFFAIRS, PETERSON AFB, CO 80914-5001 PHONE: (719) 554-3523 AUTOVON: 692-3523

DEFENSE METEOROLOGICAL SATELLITE PROGRAM

The Defense Meteorological Satellite Program has been operational for more than 21 years. Its military mission is to generate weather data for operational forces worldwide. The Air Force is the Department of Defense executive agent for this program. The data from this program are also furnished to the civilian community through the Department of Commerce National Oceanic and Atmospheric Administration.

Satellites in the Defense Meteorological Satellite Program are designed to meet unique military requirements for worldwide weather information. Through these satellites, military weather forecasters can detect developing patterns of weather and track existing weather systems over remote areas.

Data from these satellites can help identify, locate and determine the intensity of severe weather such as thunderstorms, hurricanes and typhoons. They also can be used to form three-dimensional cloud analyses, which are the basis for computer forecast models to meet unique military requirements.

All of this quickly available information aids the military commander in making decisions. For example, data obtained through this program are especially valuable to support the launch, en route, target, and recovery portions of a wide variety of strategic and tactical missions.

Defense Meteorological Satellite Program satellites provide meteorological data in real time to Air Force, Navy and Marine Corps tactical ground stations and Navy ships worldwide. These data are also stored in recorders on the satellites for later transmission to one of three ground stations located near Fairchild Air Force Base, Wash., Loring Air Force Base, Maine, and Kaena Point, Hawaii. From these command stations, data are relayed by a commercial communications satellite to the Air Weather Service's Air Force Global Weather Central at Offutt Air Force Base, Neb., and to the U.S. Navy's Fleet Numerical Oceanography Center at Monterey, Calif., where this information is used to compile numerous worldwide weather products. Command and control of Defense Meteorological Satellite Program satellites is accomplished by Air Force Space Command's 1000th Satellite Operations Group at Offutt AFB, Neb., with detachments at Fairchild Air Force Base, Wash., and Loring Air Force Base, Maine.

Current satellites in the Defense Meteorological Satellite Program are designated as the Block 5D-2 Integrated Spacecraft System because the functions of the launch vehicle's upper-stage and the orbital satellite have been integrated into a single system. This system navigates from lift-off and provides guidance for the spacecraft from booster separation through orbit insertion, as well as electrical power, telemetry, attitude control and propulsion for the second stage.

-MORE-

(Current as of August 1988)

Block 5D-2 has many improvements over earlier Defense Meteorological Satellites, including more sensors with increased capability and increased life span. The satellites circle the Earth at an altitude of about 500 miles in a near-polar, sun-synchronous orbit. Each scans an area 1,800 miles wide and can cover the Earth in about 12 hours. Pointing accuracy of the satellites is maintained by four reaction wheel assemblies that provide three-axis stabilization.

The 5D-2 spacecraft is divided into five major sections: a precision mounting platform for sensors and other equipment requiring precise alignment; an equipment support module, which encloses the major portion of the electronics; a reaction-control equipment support structure containing the spent second-stage rocket motor and supporting the ascent phase reaction-control equipment; a solar cell array; and the booster adapter. The sun-tracking, deployable solar array is covered with 12,500 silicon cells that produce 1,000 watts of power for operating the spacecraft systems. The booster adapter provides electrical interfaces between the satellite and ground test equipment and is the structural interface between the satellite and the booster.

The primary sensor on board is the Operational Linescan System that "sees" visible and infrared cloud-cover imagery to be used in analyzing cloud patterns. The spacecraft design allows other mission sensors to be flown. For example, one measures temperature and moisture; another accurately measures the location and intensity of the aurora to aid radar operations and long-range ground communications in the northern hemisphere; a third measures soil moisture, atmospheric moisture, and sea state; a fourth measures the precipitating electrons that cause the aurora; and a fifth measures X-rays.

Four Block 5D-2 satellites have been placed in orbit. The first two, launched in December 1982 and November 1983, exceeded their expected on-orbit lives. Their replacements were launched in June 1987 and February 1988. Block 5D-2 satellites are launched on Atlas-E boosters from Vandenberg Air Force Base, Calif.

Specifications

Primary function: Defense Meteorological Satellite System.

Prime contractor: GE Astro Space.

Sensor supplier: primary sensor -- Westinghouse Electronics Corporation; mission sensors -- Aerojet Electrosystems Company, Hughes Aircraft, Sandia National Laboratories; Air Force Geophysics Laboratory.

Command, Control and Communications and user equipment contractor: Harris Corporation.

Power plant: deployable, sun-tracking solar array.

Dimensions: height 11 ft 6 in; width 4 ft 9 in; length 19 ft 3 in (in orbit with solar array deployed).

Weight: launch, 3,212 lb; in orbit, 1,750 lb, including 520 lb sensor payload.

Status: operational.